

SEQUENCE LISTING

<110> SUNTORY LIMITED

<120> A gene encoding an enzyme for catalyzing biosynthesis of lignan,
and use thereof

<130> SU0411

<150> JP 2003-341313

<151> 2003-09-30

<150> JP 2003-432383

<151> 2003-12-26

<160> 79

<170> PatentIn Ver. 2.1

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ctggcgaaga tcagccgtga gaaggtagag aaaggcctga ttccagttct tgaaacgggtg 480
tgcctggaaa atcgggtggt cgatttgcag gatttgttcc agaggttgac gtttgatata 540
acttgatcat ttgttactgg ttatgatcct ggatgcttgt ctgttgattt gcctgatgtt 600
cctttctcga aagccctaga tgatgccgaa gaagcgatat tcatgcgcca tgtggttcct 660
gaaaagattt ggaaacttca gaggtgggtt ggggttggat ctgagagaaa attgagcaag 720
gctcgtgaag tcttggatag cgtcattggc aggtatatcg cgctgaagcg cggcgaaatg 780
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tacatgactg tgggagacga tggactcaa acccatgatt tgaaatgtga tgacaagttc 900
ttgagggaca cgatactgaa tctaattgatt gcagggcggg acacgacgag ttctgctctg 960
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gaaccgacaa tgaaagtgat gttctcattg tacgccatgg gacggatgga atccgttttg 1260
ggcgaggatt gcttggaaat caagccggag aggtggattt ctgatagggg atcgatcaag 1320
cacgagccct catacaagtt cttggctttc aatgctggtc cgaggacttg cttggggaag 1380
gatgtggctt tcgctcaggt gaaggcagtg gccgccacct taatccataa ctaccaagtt 1440
cacgtggcag acggccaccg cgtgctgccc aattgttcca tcatcctcta catgaggaat 1500
ggattgaagg ttagggttgc caatagatgg tctgctaaga aaaat 1545

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<210> 56
 <211> 515
 <212> PRT
 <213> Sesamum indicum

<220>
 <223> SiP288

<400> 56
 Met Val Gly Ile Val Tyr Ile Glu Leu Phe Leu Ser Val Met Trp Phe
 1 5 10 15
 Met Ala Leu Trp Val Trp Leu Asn Tyr Arg Ala Leu Ala Trp Asn Trp
 20 25 30
 Pro Val Ile Gly Met Leu Pro Thr Leu Leu Leu His Val Ser Arg Ile
 35 40 45
 His Asp Asn Cys Thr Glu Ile Met Gly Lys Ser Arg Arg Gly Thr Phe
 50 55 60
 His Phe Arg Gly Pro Trp Leu Ala Asp Met Asp Met Met Gly Thr Ala
 65 70 75 80
 Asp Pro Glu Asn Val His Tyr Ile Met Ser Ala Asn Phe Gln Asn Phe
 85 90 95
 Pro Lys Gly Pro Lys Phe Arg Glu Ile Phe Asp Val Leu Gly Asp Gly
 100 105 110
 Ile Phe Asn Ala Asp Ser Glu Ser Trp Arg Asp Gln Arg Arg Val Ala
 115 120 125
 Arg Ala Leu Ile Ser His His Gly Phe Leu Arg Phe Leu Ala Lys Ile

130 135 140
 Ser Arg Glu Lys Val Glu Lys Gly Leu Ile Pro Val Leu Glu Thr Val
 145 150 155 160
 Cys Leu Glu Asn Arg Val Val Asp Leu Gln Asp Leu Phe Gln Arg Leu
 165 170 175
 Thr Phe Asp Thr Thr Cys Thr Phe Val Thr Gly Tyr Asp Pro Gly Cys
 180 185 190
 Leu Ser Val Asp Leu Pro Asp Val Pro Phe Ser Lys Ala Leu Asp Asp
 195 200 205
 Ala Glu Glu Ala Ile Phe Met Arg His Val Val Pro Glu Lys Ile Trp
 210 215 220
 Lys Leu Gln Arg Trp Phe Gly Val Gly Ser Glu Arg Lys Leu Ser Lys
 225 230 235 240
 Ala Arg Glu Val Leu Asp Ser Val Ile Gly Arg Tyr Ile Ala Leu Lys
 245 250 255
 Arg Gly Glu Met Arg Ser Arg Gly Ile Ser Ile Asp Cys Glu Asn Glu
 260 265 270
 Asp Gly Val Asp Leu Leu Thr Ser Tyr Met Thr Val Gly Asp Asp Gly
 275 280 285
 Thr Gln Thr His Asp Leu Lys Cys Asp Asp Lys Phe Leu Arg Asp Thr
 290 295 300
 Ile Leu Asn Leu Met Ile Ala Gly Arg Asp Thr Thr Ser Ser Ala Leu
 305 310 315 320
 Thr Trp Phe Ile Trp Leu Val Ser Thr His Ala Glu Val Glu Lys Arg
 325 330 335
 Ile Arg Asp Glu Leu Lys Ser Phe Leu Pro Ala Gly Glu Arg Glu Lys
 340 345 350
 Trp Arg Val Phe Gly Val Glu Glu Thr Lys Lys Leu Val Tyr Met His
 355 360 365
 Gly Ala Ile Cys Glu Ala Leu Arg Leu Tyr Pro Pro Val Pro Phe Gln
 370 375 380
 His Lys Glu Pro Val Glu Pro Asp Ile Leu Pro Ser Gly His Phe Val
 385 390 395 400
 Glu Pro Thr Met Lys Val Met Phe Ser Leu Tyr Ala Met Gly Arg Met
 405 410 415
 Glu Ser Val Trp Gly Glu Asp Cys Leu Glu Phe Lys Pro Glu Arg Trp
 420 425 430
 Ile Ser Asp Arg Gly Ser Ile Lys His Glu Pro Ser Tyr Lys Phe Leu

435 440 445
 Ala Phe Asn Ala Gly Pro Arg Thr Cys Leu Gly Lys Asp Val Ala Phe
 450 455 460
 Ala Gln Val Lys Ala Val Ala Ala Thr Leu Ile His Asn Tyr Gln Val
 465 470 475 480
 His Val Ala Asp Gly His Arg Val Leu Pro Asn Cys Ser Ile Ile Leu
 485 490 495
 Tyr Met Arg Asn Gly Leu Lys Val Arg Val Ala Asn Arg Trp Ser Ala
 500 505 510
 Lys Lys Asn
 515

<210> 57
 <211> 1494
 <212> DNA
 <213> Sesamum indicum

<220>
 <223> SiP168

<400> 57
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 gccaaactct ccaaaacctt cgggcccctg atgcgtctca agctgggaac catgacaaca 240
 gttgttgtat cctccccgga aatctccagg atcgtgctgc aacaatatga ccaagttttc 300
 tccagccgaa cacacgcaga tgccatccga gcacttgacc accacaaaca ttccgtcgcc 360
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 tcgggccaaa agcttgatgc gaaccagggc ctgaggaggg agaagttgcg taatttgcaa 480
 gactatgtga atgaatgctg cgttagtggc caggtcgtgg atattggtgt agctgccttt 540
 acgacgaccc ttaatctgat atcggccact cttttctcgg tggattttgc tgatttttgt 600
 tctggttcgt ctcaagagct taaggatgtt atgagcggga tagcgtctat catcgccga 660
 ccaaattttg ctgattgttt ccctcttctt cggctgggtg atccacaggg catcttccgc 720
 cagaccacgt tacatttcaa caagtgtttt aagatctttg atgaaattat ccgtcaaagg 780
 ctacagacca atgattcggg gacgaaaagt gacatgctga aagagcttct tgaaatcaac 840
 cagaaagatg agtctgaatt gagctttgac gagatcaagc atttactcct ggatctactt 900
 gtcgcaggaa cggacacaaac ttcaagtaca gtggaatggg caatgacgga gctagtgcgc 960
 caccctgaga aaatgtcgaa agccagaaat gagttaagaa atgtggtggg actgaataaa 1020
 gaaattcaag aatcagacat ctcaagactc ctttacctac gagcagtggg gaaagaaagt 1080
 ttcaggcttc accctgcaac tcctttatcg gtacctcaca aggccgacga ggaagcagaa 1140
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 agagattcaa gcatatggag gaaccctgat gtattcatgc ccgagaggtt cttggagaca 1260
 gaaattgatg tccgtggcca acacttcgag ctgcttcctt ttggcggggg gaggaggatt 1320
 tgcgtggggc tgccgttagc ctatcgtatg atccatctcg tgcttgccac ttccataagc 1380
 gactatgatt ggaaacttga aggagggtcg aaaactgaag aaatggacat gagtgaagaa 1440
 ttcggcctca ccctgcaaaa agccattcct ctcaaggcac ttccagttaa aatt 1494

<210> 58
 <211> 498
 <212> PRT

<213> Sesamum indicum

<220>

<223> SiP168

<400> 58

Met Asp Leu Leu Leu Ser Leu Val Leu Leu Leu Cys Ser Ala Ala Cys
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Ile Trp Phe Leu Arg Val Val Leu Lys Pro Asn Pro Gly Pro Arg Lys
 20 25 30

Ser Ala Asn Leu Pro Pro Gly Pro Lys Pro Leu Pro Ile Ile Gly Asn
 35 40 45

Ile Leu Glu Leu Gly Glu Lys Pro His Gln Ser Leu Ala Lys Leu Ser
 50 55 60

Lys Thr Tyr Gly Pro Leu Met Arg Leu Lys Leu Gly Thr Met Thr Thr
 65 70 75 80

Val Val Val Ser Ser Pro Glu Ile Ser Arg Ile Val Leu Gln Gln Tyr
 85 90 95

Asp Gln Val Phe Ser Ser Arg Thr His Ala Asp Ala Ile Arg Ala Leu
 100 105 110

Asp His His Lys His Ser Val Ala Trp Ile Pro Ala Asp Asn Gln Trp
 115 120 125

Arg Lys Ile Arg Lys Leu Cys Lys Glu Lys Met Phe Ser Gly Gln Lys
 130 135 140

Leu Asp Ala Asn Gln Gly Leu Arg Arg Glu Lys Leu Arg Asn Leu Gln
 145 150 155 160

Asp Tyr Val Asn Glu Cys Cys Val Ser Gly Gln Val Val Asp Ile Gly
 165 170 175

Val Ala Ala Phe Thr Thr Thr Leu Asn Leu Ile Ser Ala Thr Leu Phe
 180 185 190

Ser Val Asp Phe Ala Asp Phe Gly Ser Gly Ser Ser Gln Glu Leu Lys
 195 200 205

Asp Val Met Ser Gly Ile Ala Ser Ile Ile Gly Arg Pro Asn Phe Ala
 210 215 220

Asp Cys Phe Pro Leu Leu Arg Leu Val Asp Pro Gln Gly Ile Phe Arg
 225 230 235 240

Gln Thr Thr Leu His Phe Asn Lys Cys Phe Lys Ile Phe Asp Glu Ile
 245 250 255

Ile Arg Gln Arg Leu Gln Thr Asn Asp Ser Gly Thr Lys Ser Asp Met
 260 265 270

Leu Lys Glu Leu Leu Glu Ile Asn Gln Lys Asp Glu Ser Glu Leu Ser
 275 280 285
 Phe Asp Glu Ile Lys His Leu Leu Leu Asp Leu Leu Val Ala Gly Thr
 290 295 300
 Asp Thr Thr Ser Val Thr Val Glu Trp Ala Met Thr Glu Leu Val Arg
 305 310 315 320
 His Pro Glu Lys Met Ser Lys Ala Arg Asn Glu Leu Arg Asn Val Val
 325 330 335
 Gly Leu Asn Lys Glu Ile Gln Glu Ser Asp Ile Ser Arg Leu Pro Tyr
 340 345 350
 Leu Arg Ala Val Val Lys Glu Ser Phe Arg Leu His Pro Ala Thr Pro
 355 360 365
 Leu Ser Val Pro His Lys Ala Asp Glu Glu Ala Glu Ile Asn Gly Tyr
 370 375 380
 Ile Val Pro Lys Gly Ala Gln Val Leu Met Asn Val Trp Ala Ile Gly
 385 390 395 400
 Arg Asp Ser Ser Ile Trp Arg Asn Pro Asp Val Phe Met Pro Glu Arg
 405 410 415
 Phe Leu Glu Thr Glu Ile Asp Val Arg Gly Gln His Phe Glu Leu Leu
 420 425 430
 Pro Phe Gly Gly Gly Arg Arg Ile Cys Val Gly Leu Pro Leu Ala Tyr
 435 440 445
 Arg Met Ile His Leu Val Leu Ala Thr Phe Ile Ser Asp Tyr Asp Trp
 450 455 460
 Lys Leu Glu Gly Gly Leu Lys Thr Glu Glu Met Asp Met Ser Glu Lys
 465 470 475 480
 Phe Gly Leu Thr Leu Gln Lys Ala Ile Pro Leu Lys Ala Leu Pro Val
 485 490 495
 Lys Ile

<210> 59
 <211> 1545
 <212> DNA
 <213> Sesamum indicum

<220>
 <223> SiP236

<400> 59
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actgaggtct atacatctga ccccgctaataa gttgagcaca tgttgaaaac gaatttcgaa 300
agttatggca agggacctta caattgcagc attctggggg atttgtttgg tgaaggaatt 360
ttcgcaatcg atggccataa gtggaggag cagagaaaag tgtcaagcct tgagttttct 420
acaagggttc tgagggatta cagtagcatc gtcttcagga aaaacgccgt aaggctcgca 480
aaaattctgt ctggagctgc aacttccaac caaccagtgg atattcaaga tcttttcatt 540
aaatcaactt ttgattctat ttcggaagtt gctttaggag ttgagcttga cagcttggtt 600
ggttcaaattg aagaagggtgc caaatcttagc attgctgcag acgacgtgag tatgaggaca 660
ctttggagat acgtggatgt tctgtggaag ttaaagagag ctctaaatgt tggttcagaa 720
gcaaaactga agaaaagcct tcaagtgggt gatgaatttg tgtataagct gattcatagt 780
aggactcagc aaatgaacat gccaggaaat gattctgtta tgcagctgaa gaaagacgac 840
atthttgtcaa gattcttgca acttactgag gccactccca agtacttgag ggacataaca 900
ataagcttta tagttgctgg taaagacaca acagcaacaa ctctctcctg gtttattttac 960
atgcttttgca agtatcctca tgttcaggaa aaggtggagc aagagataaa agatgagaca 1020
ggctgcaaag aggtagcaga tatctcagaa ttttcagcct gtgtgacaga agaagctttg 1080
ggcaagatgc attatctcca tgcagcattg acagaaacac tgaggattta tccagcagtt 1140
gcggtggatg caaagcaatg tttgtgtgat gatataatgc cggatgggtt cagtgttaag 1200
aagggggaca tgggtggctta tcaaccatat gcaatgggaa ggatgaaatc catatgggtt 1260
aatgatgcag aagagttcaa accagagaga tggcttgaca aaaacggttg cttccagcag 1320
gccagccctt ttaagttttac agctttccag gccggccctc gtctttgttt ggggaaagag 1380
tttgccttatc ggcagatgaa gatattctca gccattctgc tgagattctt taccatgaaa 1440
ctaagtgatg aaagaaagac agtaaaactac agaccaatgc tcactcttct catcgacggt 1500
ggtctcattg tccgccccct tcacagaatg gacgagaaaa ctgca 1545

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<210> 60

<211> 515

<212> PRT

<213> Sesamum indicum

<220>

<223> SiP236

<400> 60

Met Ala Asn Pro Ile Asp Phe Leu Leu Ser Pro Thr Pro Tyr Val Ala
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Thr Thr Leu Leu Tyr Val Leu Phe Ser Val Leu Ile Val Arg Phe Leu
20 25 30

Ser Arg Lys Leu Leu Gly Lys Lys Arg Tyr His Pro Ile Gly Gly Thr
35 40 45

Val Phe Asn Gln Leu Leu Asn Phe Tyr Arg Leu His Asp Tyr Met Ala
50 55 60

Asp Leu Ala Gly Lys Tyr Lys Thr Tyr Arg Leu Ile Ala Pro Phe Arg
65 70 75 80

Thr Glu Val Tyr Thr Ser Asp Pro Ala Asn Val Glu His Met Leu Lys
85 90 95

Thr Asn Phe Glu Ser Tyr Gly Lys Gly Pro Tyr Asn Cys Ser Ile Leu
100 105 110

Gly Asp Leu Phe Gly Glu Gly Ile Phe Ala Ile Asp Gly His Lys Trp

115					120					125					
Arg	Glu	Gln	Arg	Lys	Val	Ser	Ser	Leu	Glu	Phe	Ser	Thr	Arg	Val	Leu
	130					135					140				
Arg	Asp	Tyr	Ser	Ser	Ile	Val	Phe	Arg	Lys	Asn	Ala	Val	Arg	Leu	Ala
	145					150					155				160
Lys	Ile	Leu	Ser	Gly	Ala	Ala	Thr	Ser	Asn	Gln	Pro	Val	Asp	Ile	Gln
				165					170					175	
Asp	Leu	Phe	Met	Lys	Ser	Thr	Phe	Asp	Ser	Ile	Ser	Glu	Val	Ala	Leu
			180					185					190		
Gly	Val	Glu	Leu	Asp	Ser	Leu	Gly	Gly	Ser	Asn	Glu	Glu	Gly	Ala	Lys
		195					200					205			
Phe	Ser	Ile	Ala	Ala	Asp	Asp	Val	Ser	Met	Arg	Thr	Leu	Trp	Arg	Tyr
	210					215					220				
Val	Asp	Val	Leu	Trp	Lys	Leu	Lys	Arg	Ala	Leu	Asn	Val	Gly	Ser	Glu
	225					230					235				240
Ala	Lys	Leu	Lys	Lys	Ser	Leu	Gln	Val	Val	Asp	Glu	Phe	Val	Tyr	Lys
				245					250					255	
Leu	Ile	His	Ser	Arg	Thr	Gln	Gln	Met	Asn	Met	Pro	Gly	Asn	Asp	Ser
			260					265					270		
Val	Met	Gln	Leu	Lys	Lys	Asp	Asp	Ile	Leu	Ser	Arg	Phe	Leu	Gln	Leu
		275					280					285			
Thr	Glu	Ala	Thr	Pro	Lys	Tyr	Leu	Arg	Asp	Ile	Thr	Ile	Ser	Phe	Ile
	290					295					300				
Val	Ala	Gly	Lys	Asp	Thr	Thr	Ala	Thr	Thr	Leu	Ser	Trp	Phe	Ile	Tyr
	305					310					315				320
Met	Leu	Cys	Lys	Tyr	Pro	His	Val	Gln	Glu	Lys	Val	Glu	Gln	Glu	Ile
				325					330					335	
Lys	Asp	Ala	Thr	Gly	Cys	Lys	Glu	Val	Ala	Asp	Ile	Ser	Glu	Phe	Ser
			340					345					350		
Ala	Cys	Val	Thr	Glu	Glu	Ala	Leu	Gly	Lys	Met	His	Tyr	Leu	His	Ala
		355					360					365			
Ala	Leu	Thr	Glu	Thr	Leu	Arg	Ile	Tyr	Pro	Ala	Val	Ala	Val	Asp	Ala
	370					375					380				
Lys	Gln	Cys	Leu	Cys	Asp	Asp	Ile	Met	Pro	Asp	Gly	Phe	Ser	Val	Lys
	385					390					395				400
Lys	Gly	Asp	Met	Val	Ala	Tyr	Gln	Pro	Tyr	Ala	Met	Gly	Arg	Met	Lys
				405					410					415	
Ser	Ile	Trp	Gly	Asn	Asp	Ala	Glu	Glu	Phe	Lys	Pro	Glu	Arg	Trp	Leu

[illegible]

<210> 61
<211> 34
<212> DNA
<213> Artificial Sequence

<223> Description of Artificial Sequence: Artificially
Synthesized Primer Sequence, Bam-SST-FW2

<400> 61
tggatcccaa ctcatagagt actcaaaaac gcctt 34

<210> 62
<211> 24
<212> DNA
<213> Artificial Sequence

<223> Description of Artificial Sequence: Artificially
Synthesized Primer Sequence, SiP189-Nco-RV

<400> 62
gcaaattgac aacctgggtg ttct 24

<210> 63
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<223> Description of Artificial Sequence: Artificially
Synthesized Primer Sequence, GR-SST-RV1

<400> 63
cacatgaacg agacgaactg ggtttg

27

<210> 64
<211> 506
<212> PRT
<213> Sesamum radiatum

<220>
<223> SrSiP189

<400> 64
Met Glu Ala Glu Met Leu Tyr Ser Ala Leu Ala Leu Thr Phe Ala Ile
1 5 10 15
Phe Met Val Tyr Arg Ile Leu Ser Asn Ser Gln Glu Lys Ser Ser Leu
20 25 30
Ile Lys Leu Pro Pro Ser Pro Gly Trp Leu Pro Val Ile Gly His
35 40 45
Val His Leu Met Lys Asn Leu Leu His Arg Thr Leu Tyr Asp Phe Ser
50 55 60
Gln Lys Leu Gly Pro Ile Phe Ser Leu Arg Phe Gly Thr Arg Leu Val
65 70 75 80
Val Val Val Ser Ser Ser Ser Leu Val Glu Glu Cys Phe Thr Lys Tyr
85 90 95
Asp Ile Val Leu Ala Asn Arg Pro Gln Pro Ser Val Asp Arg Arg Ser
100 105 110
Leu Gly Phe Ser Thr Thr Ser Val Ile Gly Ala Pro Tyr Gly Asp His
115 120 125
Trp Arg Asn Leu Arg Lys Leu Cys Asp Leu Glu Val Phe Ala Pro Thr
130 135 140
Arg Leu Ala Ser Phe Leu Ser Ile Arg Leu Asp Glu Arg Asp Arg Met
145 150 155 160
Ile Ser Ser Leu Tyr Lys Ile Ser Ser Ala Gly Phe Ala Lys Val Asn
165 170 175
Leu Glu Thr Lys Ile Val Glu Leu Thr Phe Asn Asn Ile Met Arg Met
180 185 190
Val Ala Gly Lys Arg Tyr Tyr Gly Glu Glu Ala Glu Asp Asp Glu Glu
195 200 205
Ala Lys Arg Phe Arg Asp Leu Thr Lys Glu Ala Leu Glu Leu Thr Ser
210 215 220

Ala Ser Asn Pro Gly Glu Ile Phe Pro Ile Leu Arg Trp Leu Gly Phe
 225 230 235 240
 Asn Gly Leu Glu Lys Lys Leu Ala Val His Ala Arg Lys Thr Asp Glu
 245 250 255
 Phe Met Gln Gly Leu Leu Asp Glu His Arg Arg Gly Glu Arg Gln Asn
 260 265 270
 Thr Met Val Asp His Leu Leu Ser Leu Gln Glu Ser Gln Pro Glu Tyr
 275 280 285
 Tyr Thr Asp Glu Ile Ile Thr Gly Leu Ile Val Ala Leu Ile Ile Ala
 290 295 300
 Gly Thr Asp Ala Ser Val Val Thr Thr Glu Trp Ala Met Ser Leu Ile
 305 310 315 320
 Leu Asn His Pro Gln Val Leu Glu Lys Ala Arg Lys Glu Leu Asp Thr
 325 330 335
 Leu Val Gly His Glu Arg Met Val Asp Glu His Asp Leu Pro Lys Leu
 340 345 350
 Arg Tyr Leu His Cys Ile Val Leu Glu Thr Leu Arg Leu Phe Pro Ser
 355 360 365
 Val Pro Thr Leu Val Pro His Glu Pro Ser Glu Asp Cys Lys Ile Gly
 370 375 380
 Gly Tyr Asn Val Pro Lys Gly Thr Met Ile Leu Val Asn Ala Trp Ala
 385 390 395 400
 Ile His Arg Asp Pro Lys Val Trp Asp Asp Pro Leu Ser Phe Lys Pro
 405 410 415
 Asp Arg Phe Glu Thr Met Glu Val Glu Thr His Lys Leu Leu Pro Phe
 420 425 430
 Gly Met Gly Arg Arg Ala Cys Pro Gly Ala Gly Leu Ala Gln Lys Phe
 435 440 445
 Val Gly Leu Ala Leu Gly Ser Leu Ile Gln Cys Phe Glu Trp Glu Arg
 450 455 460
 Met Ser Ala Glu Lys Ile Asp Leu Asn Glu Gly Ser Gly Ile Thr Leu
 465 470 475 480
 Pro Lys Ala Lys Thr Leu Glu Ala Met Cys Lys Pro Arg His Ile Met
 485 490 495
 Glu Arg Val Leu Arg Gln Val Ser Asn Val
 500 505

<211> 1518
 <212> DNA
 <213> *Sesamum radiatum*

<220>
 <223> SrSiP189

<400> 65
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 agaattcttt ctaattcgca ggagaaaagc agcctgatta agctgccgcc gagcccgccg 120
 ggttggtccc cggatgatcg ccacgttcat ctcatgaaa atctcctcca tagaacacta 180
 tacgacttct cccagaaact gggaccata ttttcctcc ggttcggcac ccgctcgtg 240
 gtagtgggtg cctcctcctc cctggtcgag gaatgtttca ccaagtacga cattgtcttg 300
 gccaacccgc ctcagccctc tgcgaccgg cgctcactcg ggttcagcac caccagcgta 360
 atcggcgccc cgtacgggga ccattggcgc aacctgcgaa agttgtgcga tcttgaagta 420
 ttcgccccga cccgtctcgc ctctgtttta tccatcaggc ttgacgagag ggaccgatg 480
 atttcgtcgt tgtacaaaat ctctgcccgc ggtttcgcga aggtgaattt ggagacgaag 540
 attgttgagc tgacgtttaa taacataatg aggatgggtg cggggaagag atactatggg 600
 gaggaggcgg aggacgacga ggaggcgaag aggttcaggg acctgacgaa ggaggctttg 660
 gagttgacga gcgcttccaa tcctggtgag atatttccaa tattgcggtg gcttggtttc 720
 aatgggttgg agaagaagct ggctgttcac gcgcggaaga cggatgagtt catgcaaggg 780
 ctgctggacg aacaccgacg gggcgagcgc cagaacacca tggttgatca tttgctttcg 840
 ttgcaggaat ctcaacctga gtactacact gatgaaatca tcaactggcct catagtgtca 900
 ttgataattg cgggaacgga tgcacggtt gtaactacag aatgggcat gtcccttata 960
 ctaaatcatc cccaagtact tgaaaaggct agaaaagaac tggacactct agtaggacac 1020
 gaacgcatgg tcgatgaaca tgatctgccc aaactacgtt accttactg catagtcttg 1080
 gagaccttaa ggttatttcc ttctgttcca acgttggtgc cacacgaacc atcggaggat 1140
 tgtaaaattg ggggatacaa tgtcccaag gggacaatga tactggtgaa tgcttgggca 1200
 atacaccgag accccaaggt gtgggacgac cccttgagct ttaagcccga caggtttgag 1260
 acaatggaag tggagacaca caagctgttg ccgttcggga tgggcaggag agcgtgtccc 1320
 ggagctggat tggcgagaa gtttgtgggg ttggcttttg ggtcgctgat tcagtgtttc 1380
 gagtgggaga gaatgagtgc ggagaaaatt gacttgaacg aaggttcttg gataaccttg 1440
 cctaaagcta agacgttgga agccatgtgc aaacctagac atatcatgga gagagttctt 1500
 cgtcaggttt cgaacgtc 1518

<210> 66
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Artificially
 Synthesized Primer Sequence, NtUBQ-FW

<400> 66
 ggaatgcaga tcttcgtcaa

20

<210> 67
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Artificially

Synthesized Primer Sequence, NtUBQ-RW

<400> 67
cctagaaacc accacgga 18

<210> 68
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Artificially
Synthesized Primer Sequence, SiP189-bam-FW

<400> 68
ttttcagcca acatggaagc tgaa 24

<210> 69
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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Artificially Synthesized Primer Sequence, gSST-FW1

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<210> 76

<211> 30

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Artificially Synthesized Primer Sequence, gSST-RV2

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<210> 77

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<213> Sesumum alatum

<400> 78

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 Leu His Leu Ile Lys Asn Pro Leu His Arg Thr Leu Tyr Asp Cys Ser
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 Val Val Val Ser Ser Ser Ser Leu Val Glu Glu Cys Phe Thr Lys Tyr
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 Asn Gly Phe Glu Lys Gln Leu Pro Val His Ser Arg Lys Thr Asp Glu
 245 250 255
 Ile Met Gln Gly Leu Leu Asp Glu His Arg Arg Gly Glu Arg Gln Asn
 260 265 270
 Thr Met Val Gly His Leu Leu Ser Leu Gln Glu Ser Gln Pro Asp Tyr
 275 280 285

Tyr Thr Asp Glu Ile Ile Thr Gly Leu Ile Ile Ser Leu Ile Ile Ala
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 Gly Thr Asp Ala Ser Val Val Thr Thr Glu Trp Ala Met Ser Leu Leu
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 325 330 335
 Leu Val Gly His Glu Arg Met Val Glu Glu Asp Asp Leu Pro Lys Leu
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 Arg Tyr Leu His Tyr Ile Ile Leu Glu Thr Leu Arg Leu Phe Pro Ser
 355 360 365
 Val Pro Thr Leu Val Pro His Glu Pro Ser Glu Asp Cys Asn Ile Gly
 370 375 380
 Gly Tyr Asn Val Pro Lys Gly Thr Met Ile Ile Val Asn Ala Trp Ala
 385 390 395 400
 Ile His Arg Asp Pro Lys Val Trp Asp Asp Pro Met Ser Phe Lys Pro
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 Asp Arg Phe Glu Thr Leu Glu Val Glu Thr His Lys Leu Leu Pro Phe
 420 425 430
 Gly Met Gly Arg Arg Gly Cys Pro Gly Ala Gly Leu Ala Lys Lys Phe
 435 440 445
 Val Gly Leu Ala Leu Ala Ser Leu Ile Gln Cys Phe Asp Trp Glu Arg
 450 455 460
 Ile Ser Ala Glu Lys Ile Asp Leu Lys Glu Gly Ala Ser Arg Ile Thr
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<210> 79

<211> 1524

<212> DNA

<213> Sesumum alatum

<400> 79

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